Applicant : Blaise deB. Frederick et al.   Attorney's Docket No.: 04843-036001 / Frederick -
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present invention is the novel NMR function generator 12 which is to be later described and which serves to generate various waveforms and control signals which are used by the remaining subsystems of the NMR imaging system 10." (col. 5, lines 34-38.) As shown in Figure 1, the NMR function generator 12 connects with an RF transmitter 20 and field gradient drivers 18 to interface with magnet 14 to modulate magnetic fields for imaging a patient 16. Briggs explains how this operates:

> The NMR imaging system 10 includes a magnet 14 of a size and shape that allows it to surround a patient 16. In the magnet 14 are arranged a plurality of coils (not shown) which are energized by external signals to generate magnetic fields which surround the patient 16. ...
>
> The magnet 14 operates in conjunction with a plurality of subsystems. The subsystems interface with the magnet and provide means for generating the signals which drive the magnetic coils and circuits for detecting NMR signals which are emitted from the patient's body. ...
>
> These subsystems include a field gradient driver block 18 which buffers and amplifies analog waveforms which drive the coils and which are received from the function generator 12. An RF transmitter subsystem 20 is interfaced to the magnet 14 and provides RF modulation for modulating the magnetic fields to enable the separation of the NMR signals from other signals which are present in and around the patient 16. The RF transmitter 20 is also controlled by the function generator 12.

(col. 5, line 42 to col. 6, line 2.) Thus, Briggs' invention is a waveform generator used in NMR imaging for generating magnetic signals to image a patient by detecting NMR signals emitted from the patient's body.

By contrast, the claims relate to simulating a waveform of a subject undergoing a magnetic resonance scan. Briggs does not disclose generating waveforms to <u>simulate</u> the waveform of a subject undergoing a magnetic resonance scan. Instead, Briggs discloses generating waveforms <u>for use in scanning a subject</u>.

Nothing in Briggs discloses simulating the waveform of a subject undergoing a magnetic resonance scan. Figure 1 shows how Briggs' function generator is used in actual scanning of a subject. Figures 2-10 show details of the components in Briggs' NMR imaging system. There is no disclosure in any of these figures of simulating the waveform of a subject undergoing a magnetic resonance scan.

There is also no such disclosure in the text of the specification. After setting forth the basic operation of the function generator at columns 5-6, Briggs describes collecting the NMR signals emitted by the patient. (col. 6, lines 3-39 ("The receiver 22 includes transducers for sensing the electromagnetic NMR signals which emanate from the patient 16.").) Briggs also describes having the function generator receive physiological inputs. (col. 6, lines 40-65.) Briggs then describes the data processing aspects of the NMR system. (col. 6, line 66 to col. 7, line 32.) The remainder of the specification discusses the components of Briggs' NMR imaging system in more detail. Nowhere in the specification does Briggs discuss simulation of any kind.

Since the independent claims relate to generating a waveform that simulates a waveform of a subject undergoing a magnetic resonance scan, while Briggs discloses generating waveforms for use in actual magnetic resonance scanning, Briggs does not anticipate the independent claims. The dependent claims that depend from these independent claims are therefore also not anticipated.

Claims 29-32 and 37-40:

Examiner rejected claims 29-32 as unpatentable over Briggs in further view of Schramm (US 4,014,109), and rejected claims 37-40 over Briggs in further view of Gevines (4,736,751). For the same reason discussed above, the combination of Briggs with Schramm does not render obvious dependent claims 29-32, and the combination of Briggs with Gevines does not render obvious dependent claims 37-40. Neither Schramm nor Gevines disclose a generated "waveform simulates a waveform of a subject undergoing a magnetic resonance scan." (Schramm was earlier distinguished on this basis in Applicant's June 23, 2003 reply to Examiner's January 21, 2003 office action.) Thus, even in combination, these references do not meet all the limitations of the claims.

Additional remarks:

Applicant has not addressed all of Examiner's positions regarding the dependent claims. In doing so, Applicant does not imply agreement with Examiner and does not intend any

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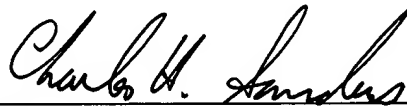MCL 1805.0

surrender of rights. Applicant believes all claims rejected by the Examiner are allowable based on the above discussion.

Applicant submits that all claims are in condition for allowance. Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 8/2/04

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